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From skeuomorphism to flat design: age-related differences in performance and aesthetic perceptions

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ABSTRACT

The design of graphical user interfaces has been evolving from skeuomorph interfaces – which use elements that mimic the aesthetics and functionality of their real-world counterparts – to minimalist and flat designs. Despite the growing popularity of these new design approaches, they can be challenging for older adults who experience a decline in visual and cognitive abilities. Still, little is known about user performance, aesthetic perception, and preference of older adults, particularly in comparison to younger users and traditional skeuomorph interfaces. In this paper, we examine the performance and aesthetic perception of older (65–77 years old) and younger (20–40) adults with three design approaches: skeuomorph, skeuominimalist, and flat design. Results show flat design is either slower or less accurate than traditional skeuomorph interfaces for older adults across three tasks: visual search, identifying clickable objects, and multiple page navigation. Younger adults were less susceptible to performance differences between design approaches, but still subject to 'click uncertainty' with flat interfaces. Skeuominimalism did not show clear performance benefits over flat design or skeuomorphism, while the latter reduced the performance gap between age groups. Finally, younger adults preferred the simplicity of skeuominimalism, while older adults preferred skeuomorph interfaces because of the perceived usability, beauty, and trustiness.

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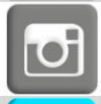
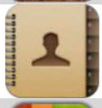
Table 3. Icons used in the experiment.

Icon	Skeuomorph	Skeuominimalist	Flat
Book			
Calculator			
Calendar			
Camera			
Clock			
Chef			
Compass			
Contacts			
Games			
Messages			
Microphone			
Movies			
Notes			
Settings			
Phone			
Weather			

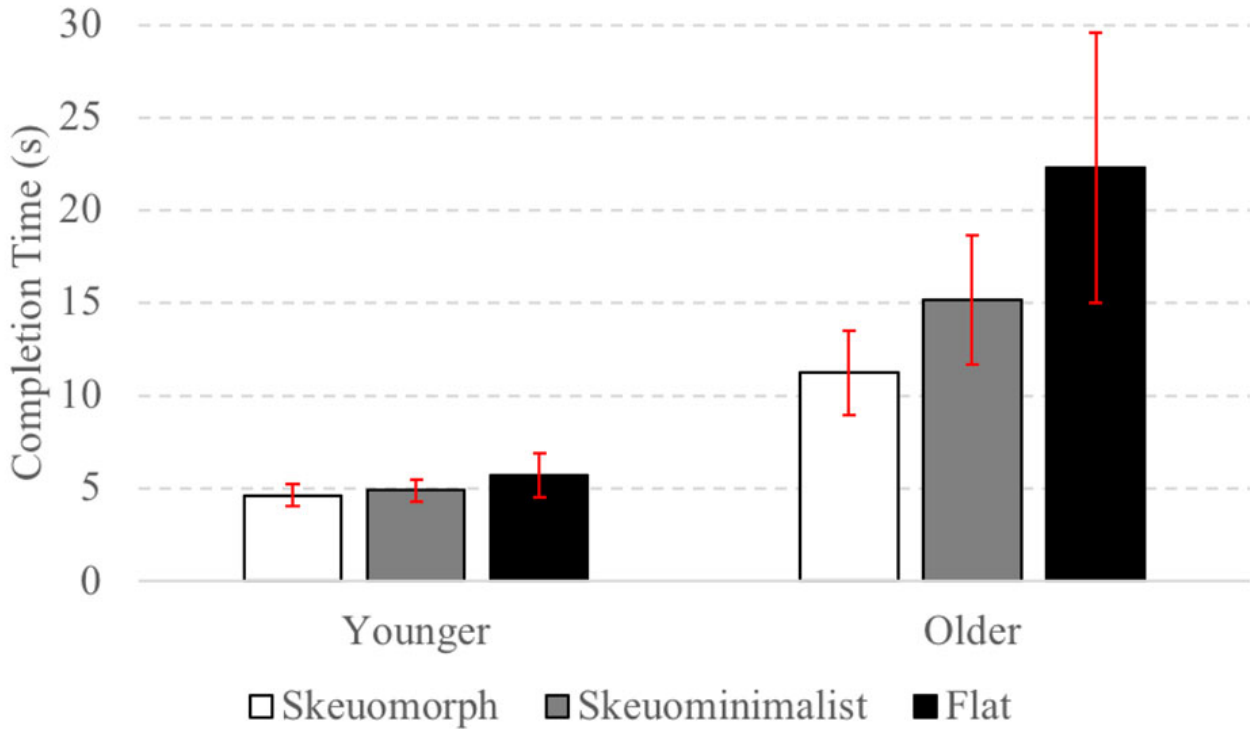


Figure 3. Completion time in visual search task across all design approaches and age groups. Lower is better. Error bars denote 95% confidence intervals.

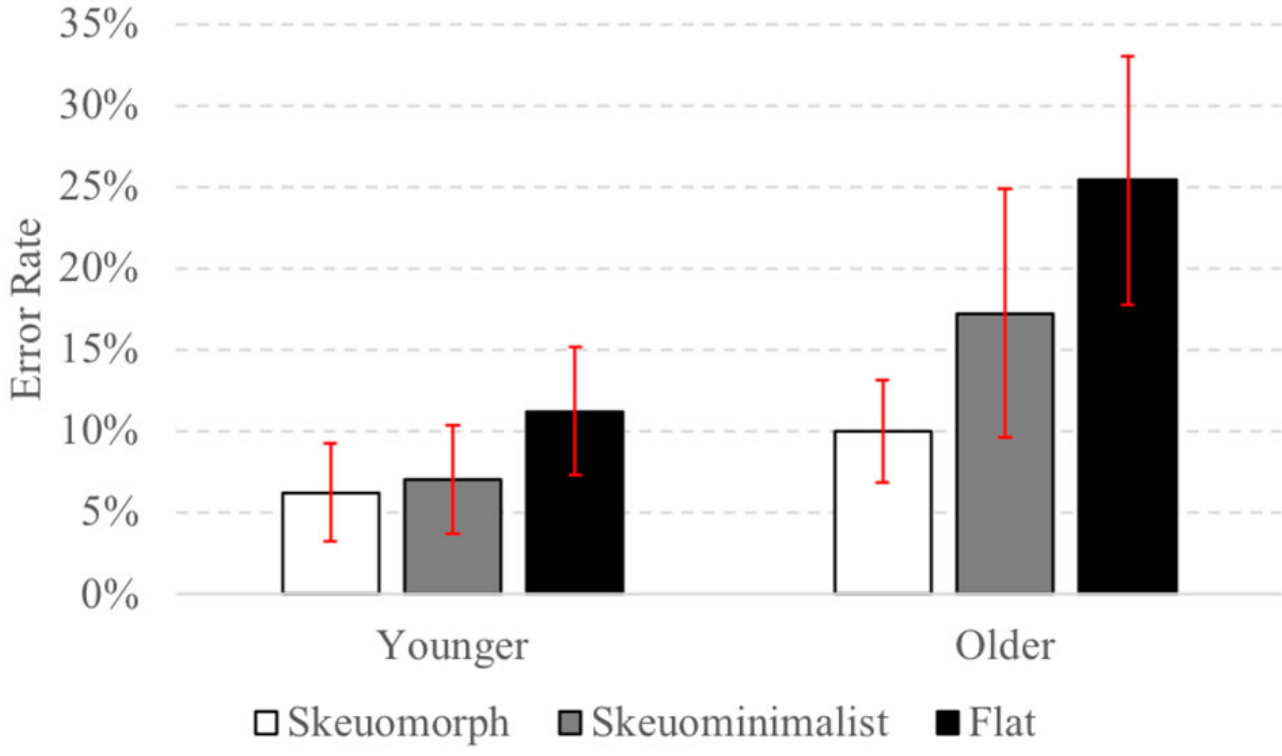


Figure 4. Error rate in clicking objects task across all design approaches and age groups. Lower is better. Error bars denote 95% confidence intervals.